

Service Manual

LW/MW/FM Stereo Tuner Tuner

ST-CH7L



Because of unique interconnecting cables, when a component requires service, send or bring in the entire system.

■ SPECIFICATIONS (DIN 45 500)

■ FM TUNER SECTION

Frequency range	87.50~108.00 MHz (0.05 MHz step)
Sensitivity	1.5 μ V (IHF, usable)
S/N 30 dB	1.5 μ V (75 Ω)
S/N 26 dB	1.3 μ V (75 Ω)
S/N 20 dB	1.2 μ V (75 Ω)
IHF 46 dB stereo quieting sensitivity	28 μ V (75 Ω)
Total harmonic distortion	
MONO	0.2%
STEREO	0.3%
S/N	
MONO	60 dB (74 dB, IHF)
STEREO	58 dB (70 dB, IHF)
Frequency response	20 Hz~15 kHz, +0.5 dB~-1.5 dB
Alternate channel selectivity \pm 400 kHz	50 dB
Stereo separation 1 kHz	40 dB
10 kHz	30 dB
Channel balance (250 Hz~6,300 Hz)	\pm 1.5 dB
Limiting point	1.2 μ V
Bandwidth	
IF amplifier	180 kHz
FM demodulator	1000 kHz
Antenna terminal	75 Ω (unbalanced)

■ LW/MW TUNER SECTION

Frequency range	
MW	522~1611 kHz (9 kHz-step)
	530~1620 kHz (10 kHz-step)
LW	144~288 kHz (9 kHz-step)
	146~290 kHz (+2 kHz-shift)

Color

(K) Black Type

Areas

Country Code	Area	Color
(E)	Continental Europe.	(K)
(GC)	Asia, Latin America, Middle Near East and Africa.	
(GN)	Oceania.	

System: SC-CH7

Sensitivity (S/N 20 dB)

MW	20 μ V, 300 μ V/m
LW	50 μ V

Selectivity (\pm 9 kHz)

MW	(at 999 kHz) 50 dB
LW	(at 216 kHz) 50 dB

■ TIMER SECTION

Clock	Quartz-lock type 24-hour indication
Functions	24-hour programmable; weekly (1 time) once only (1 time) sleep (1~120 min., 1-min. intervals)
Setting intervals	1 minute~23 hours, 59 minutes (at 1 min. intervals)

■ GENERAL

Power consumption	8 W
Dimensions (W×H×D)	215×55×295 mm (8 ¹⁵ / ₃₂ "×2 ⁵ / ₃₂ "×11 ⁵ / ₈ ")
Weight	1.4 kg (3.0 lb.)

Notes:

- Total harmonic distortion is measured by the digital spectrum analyzer.
- Specifications are subject to change without notice.
- Weight and dimensions shown are approximate.

System	Tuner	Amplifier	CD Player	Cassette Deck	Speakers
SC-CH7	ST-CH7L	SU-CH7	SL-CH7	RS-CH7	SB-CH7

Technics/Panasonic

(E)

(GC) (GN)

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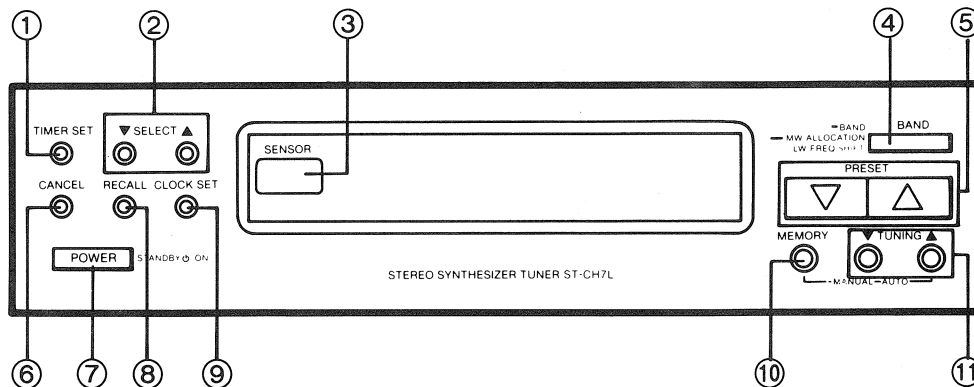
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Note:

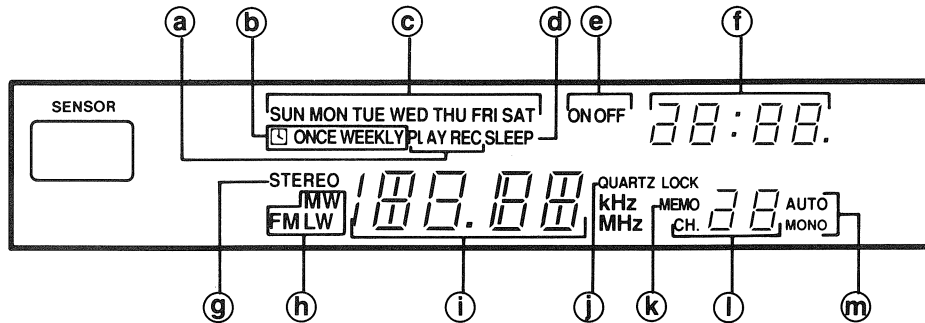
Refer to the service manual for Model No. SU-CH7, Order No. AD9104082C8 for information on ACCESSORIES, INSTALLATION OF THE SYSTEM, CONNECTIONS and PACKAGING.

LOCATION OF CONTROLS



Tuner: control section

- ① **Timer set button (TIMER SET)**
This button is used when making the timer setting.
- ② **Timer select buttons (▼ SELECT ▲)**
These buttons are used when setting the time. And when making the timer setting, to select the type of timer operation, the day, the time, etc.
- ③ **Remote signal sensor (SENSOR)**
- ④ **Band select button (BAND)**
This button is used to select either the MW, LW or FM band.
- ⑤ **Preset-tuning buttons (▼ PRESET ▲)**
These buttons are used to select channel numbers for a broadcasting station which has been stored in the tuner's memory.
- ⑥ **Timer cancel button (CANCEL)**
This button is used to cancel the timer setting.
- ⑦ **Power "STANDBY ON/OFF" switch (POWER STANDBY ON/OFF)**
This switch switches ON and OFF the secondary circuit power only. The unit is in the "standby" condition when this switch is set to the STANDBY ON position. Regardless of the switch setting, the primary circuit is always "live" as long as the power cord is connected to an electrical outlet.
- ⑧ **Timer setting confirmation button (RECALL)**
This button is used to confirm the timer setting.
- ⑨ **Clock set button (CLOCK SET)**
This button is used to set the present time.
- ⑩ **Memory button (MEMORY)**
This button is used when presetting broadcast station frequencies into memory.
- ⑪ **Tuning buttons (▼ TUNING ▲)**
These buttons are used for tuning the desired broadcast station.



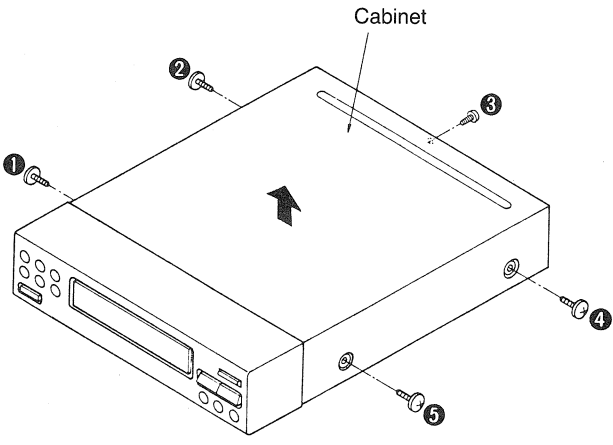
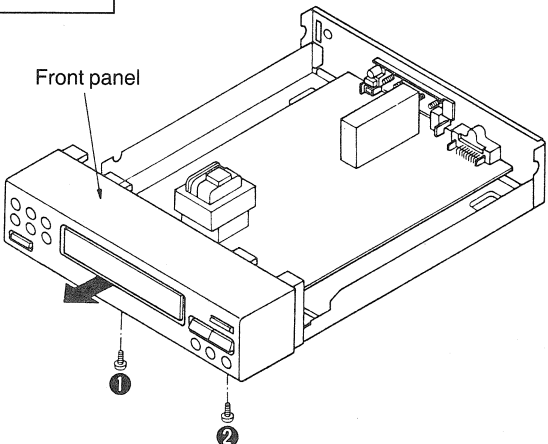
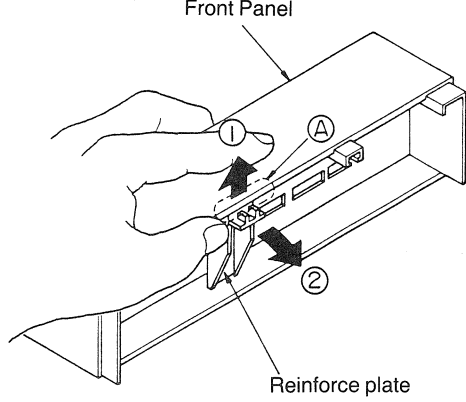
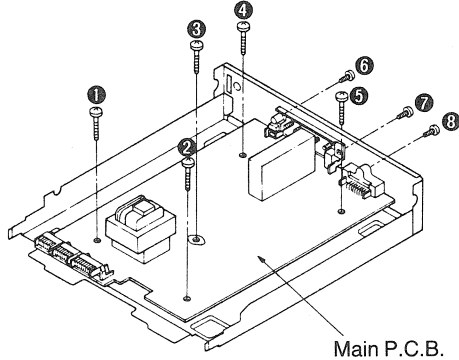
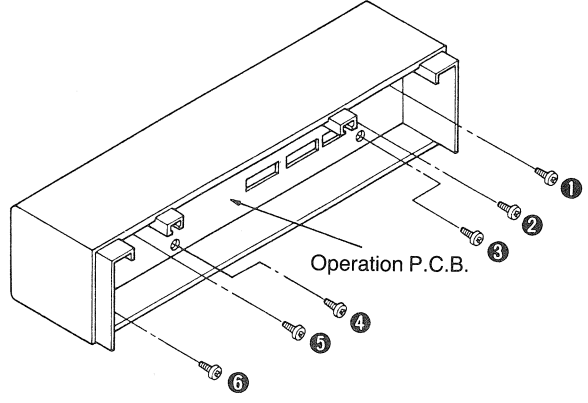
Tuner: display section

- a** **Timer play/recording indicator (PLAY, REC)**
This indicator shows that timer play mode or timer recording mode is activated.
- b** **Timer mode-indicator (ONCE, WEEKLY)**
This indicator shows the timer operation mode (ONCE or WEEKLY).
- c** **Day display (SUN–SAT)**
This display shows the present day, or the day the timer has been set for, if used.
- d** **Sleep indicator (SLEEP)**
Illuminates when the sleep timer is activated.
- e** **Timer ON/OFF indicator (ON, OFF)**
This indicator shows whether the times for timer switch-ON and switch-OFF have been set.
- f** **Time display**
This display shows the present time, or the time the timer has been set for.
- g** **FM stereo indicator (STEREO)**
This indicator automatically illuminates when an FM stereo broadcast is being received. It will not illuminate if the FM mode button is used to select monaural mode.
- h** **Band indicator (FM, MW, LW)**
Illuminates to show which band is selected.
- i** **Digital frequency display**
Displays the broadcast frequencies.
- j** **Quartz lock indicator (QUARTZ LOCK)**
This indicator illuminates when the unit is precisely tuned to a broadcast station.
- k** **Memory indicator (MEMO)**
This indicator illuminates when the memory button is pressed.
- l** **Preset channel display**
This display shows the channel number selected by the preset-tuning buttons.
- m** **FM mode indicator (AUTO, MONO)**
When FM broadcasts are being received, usually the "AUTO" indication is illuminated. When the FM mode is set to monaural, "MONO" illuminates.

DISASSEMBLY INSTRUCTIONS

“ATTENTION SERVICER”

Some chassis components may have sharp edges. Be careful when disassembling and servicing.

Ref. No. 1	Removal of the Cabinet		
Procedure 1	<ul style="list-style-type: none"> Remove the 5 screws (①~⑤). 		
Ref. No. 2	Removal of the Front Panel	Ref. No. 3	Removal of the Operation P.C.B.
Procedure 1→2	 <ol style="list-style-type: none"> Remove the 2 screws (①, ②). Remove the front panel in the direction of arrow. 		 <ol style="list-style-type: none"> Pull up the position ① of the front panel in the direction of the arrow ①, and then remove the reinforce plate in the direction of the arrow ②.
Ref. No. 4	Removal of the Main P.C.B.		
Procedure 1→2→4	 <ul style="list-style-type: none"> Remove the 8 screws (①~⑧). 		
2. Remove the 6 screws (①~⑥).			

MEASUREMENTS AND ADJUSTMENTS

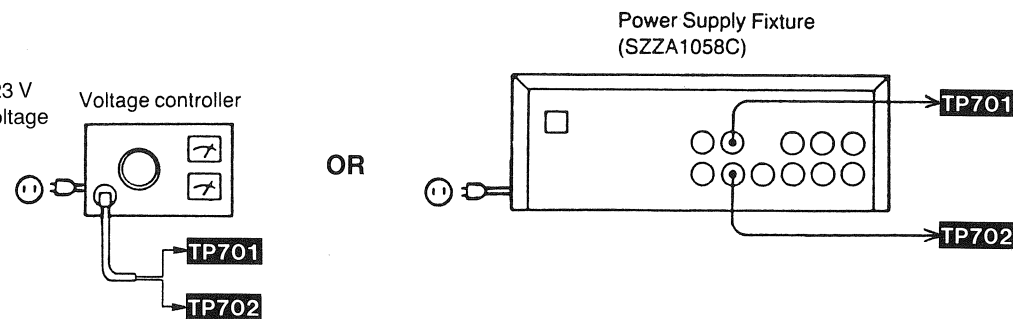
This TUNER (ST-CH7L) is powered by the amplifier (SU-CH7). To adjust it or check operations as a separate unit, follow the steps below.

1. Apply a power supply voltage of AC 23 V to **TP701** and **TP702**.
2. Power supply switch: ON

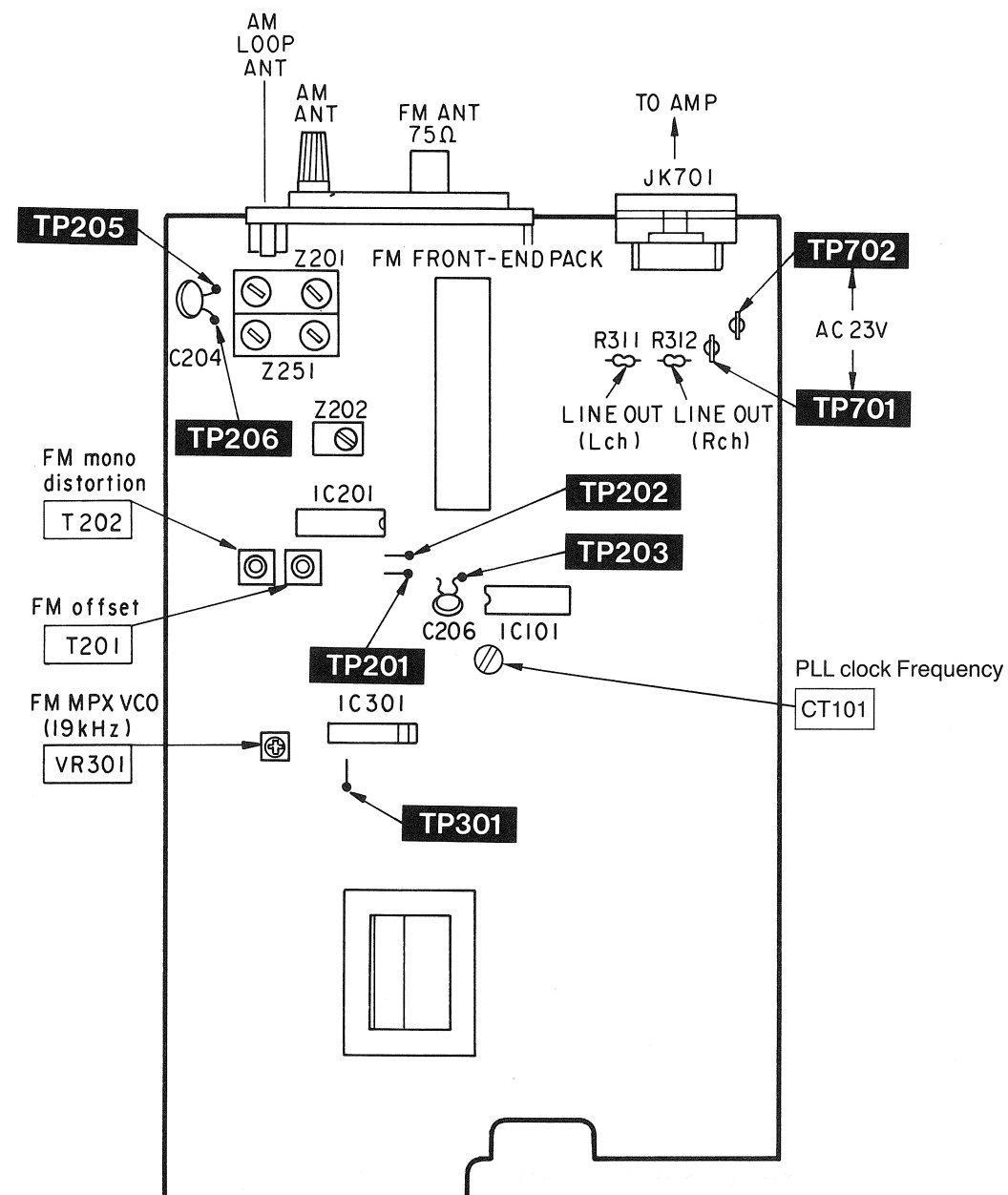
HOW TO CONNECT

Note:

Apply a power supply voltage of AC 23 V to **TP701** and **TP702** by using a Voltage Controller. If it is not available, use a Power Supply Fixture (SZZA1058C) instead.



ADJUSTMENT POINT



FM ADJUSTMENT

Control positions and equipment used

- FM signal generator (FM-SG)
- Stereo modulator
- Distortion analyser
- DC electronic voltmeter (EVM)
- Frequency counter
- Choke coil (100 μH)
- Resistor (100 kΩ)

Note: For Z201 (AM ANT and OSC coil), Z202 (AM-IFT), they are supplied as adjusted parts. So, do not turn the cores of the parts. If is not necessary to adjust the AM circuit.

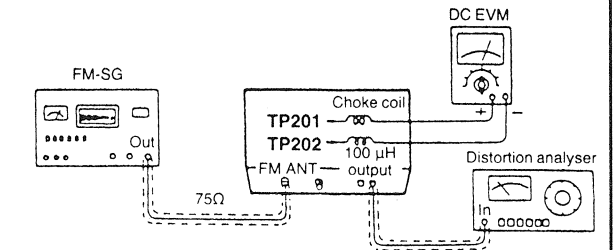
FM OFFSET VOLTAGE AND MONO DISTORTION ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "FM" mode.
3. Set the radio frequency display and signal generator to 100.10 MHz.
4. Adjust the core of **T201** so that the voltage measured in signal mode is 0 mV (0 ± 20 mV) in 300 mV range.
5. Adjust **T202** so that the distortion factor of L-CH and R-CH is minimized.
6. Repeat steps 4 and 5.

Note: The adjusting screwdriver used should be made of resin.

FM SIGNAL GENERATOR CONDITION

Modulation 100%
Modulation frequency 1 kHz
Output level 66 dB



FM MPX VCO ADJUSTMENT

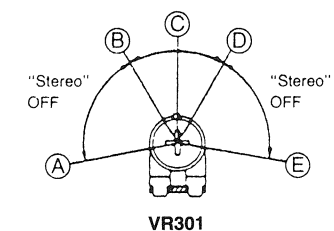
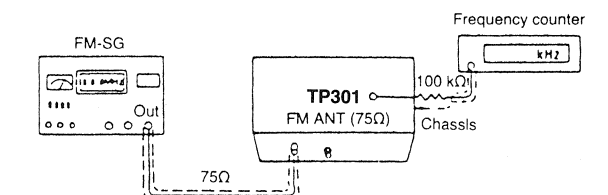
1. Test equipment connection is shown in figure.
2. Set the unit to "stereo" position.
3. Set the radio frequency display and signal generator to 100.10 MHz.
4. Adjust **VR501** for 19 kHz \pm 30 Hz on frequency counter reading.

USING ALTERNATE SYSTEM

1. Receive the stereo broadcast.
2. Adjust **VR301** until stereo indicator lights up. Fix the arm of **VR301** as shown in figure.

FM SIGNAL GENERATOR CONDITION

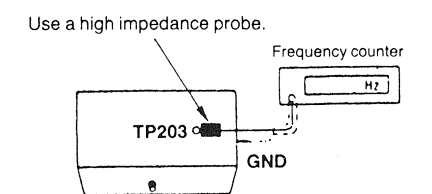
Modulation 100%
Modulation frequency 0 kHz
Output level 66 dB



- (A)-(B),
(D)-(E) "Stereo" OFF position
(B)-(D) "Stereo" ON position
(Indicator lighting)
(C) Adjust point of pilot circuit

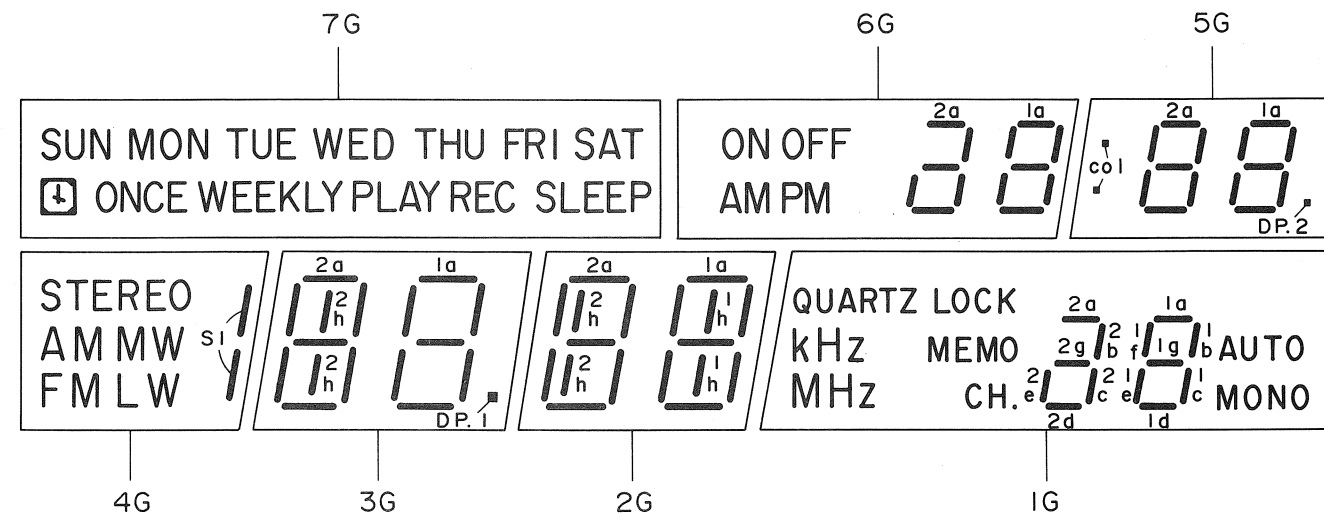
PLL CLOCK FREQUENCY ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Adjust **CT101** for 2070 \pm 0.010 kHz (2050 \pm 0.010 kHz...GC only) on frequency counter reading.



DESCRIPTION OF FL PANEL [FL901 (RSL0096-F)]

GRID ASSIGNMENT



PIN CONNECTION

PIN NO.	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1							
CONNECTION	F	F	N	P	P	P	P	P	P	P	P	P	P	P	P	P	P	N	1	2	3	4	5	6	6	C	G	G	G	G	G	G	7	P	1	1	F	F
	2	2	P	7	5	4	3	2	1	0	9	8	0	1	2	3	4	5	6	6	C	G	G	G	G	G	G	G	G	P	1	1	F	F				

Note: 1) F1, F2 Filament
 2) NP No pin
 3) 1G~8G Grid

ANODE CONNECTION

	7G	6G	5G	4G	3G	2G	1G
P0	SLEEP	AM	2d	LW	2d	2d	CH.
P1	—	PM	2e	FM	2e	2e	MHz
P2	WEEKLY	2c	2c	AM	2c	2c	kHz
P3	—	—	2g	MW	2g	2g	2a, 2d, 2e, 2g
P4	ONCE	—	2f	—	2f	2f	MEMO
P5	—	2b	2b	—	2b	2b	AUTO
P6	☐	2a, 2d, 2e, 2g	2a	STEREO	2a	2a	QUARTZ LOCK
P7	PLAY	ON	col	S1	2h	2h	2b
P8	WED	1d	1d	—	1d	1d	1d
P9	SAT	1e	1e	—	1e	1e	1e
P10	TUE	1c	1c	—	1c	1c	1c
P11	FRI	1g	1g	—	1g	1g	1g
P12	MON	1f	1f	—	1f	1f	1f
P13	THU	1b	1b	—	1b	1b	1b
P14	SUN	1a	1a	—	1a	1a	1a
P15	REC	OFF	DP, 2	—	DP, 1	1h	2c
P16	—	—	—	—	—	—	MONO

FUNCTIONS OF IC TERMINALS

IC901 (MN187125STT1)

Pin No.	Mark	I/O Division	Function	Pin No.	Mark	I/O Division	Function
1	VDD	I	Power supply (+B)	22	SBT1	O	Clock terminal for serial data.
2	OSC2	I	Connected to crystal oscillator (X901) (4.19 MHz)	23	CE	O	Serial transmission operation Chip enable terminal
3	OSC1	O		24	SBO1	O	Serial data signal output
4	VSS	I	Connected to ground terminal	25	CLOCK OUT	O	External control clock signal input-output
5	X1	I	Connected to ground terminal	26	CLOCK IN	I	
6	X0	O	Not connected	27	DATA OUT	O	External control data signal output
7	KEY2	I	Key scan signal input	28	NC	—	Not connected
8	KEY1 BIN	I	Connect to ground terminal	29	CM	I	Connectd to ground terminal
9	CR	I	Not connected	30	DATA IN	I	External control data signal input
10	STEREO	I	Stereo input Inputs when stereo signal receipt "L", monaural signal receipt "H".	31	SD	I	Input for stop signal during auto tuning. Stops auto tuning at high level. Receipt: H, No signal: L
11	DIR	I	When broadcasting receipt "L", stereo/normal broadcasting receipt "H". Not connected	32	MUT	O	Output for erasing shock noise when lock-off at PLL. <Muting out> 1. Power switch "off". 2. Frequency change (up/down, FM↔AM↔TV) Put out "H" when those of above two.
12	MONO	O	Auto/mono change over terminal.				
13	MFRO	O	Remote control signal terminal. Not connected	33	A IN	I	Not connected
14				B IN			
15	INT	I	Remote control input	35	KS1	O	Key scan signal output
16	POWER DOWN	I	Power supply level detection	37	KS3		
17	SDC	O	DTS selective output terminal. Not connected	38	DGT0	O	Digit signal output to FL display
18	BM			45	DGT7		
19	POWER	O	AC output Put out for "H" when moving. For cutting relay drive of main power supply. Becomes "H" when PLL is moving. Reverse when put the power key.	46	P71	I	Serial data signal input
20	TB	I	Band data input	47	P70 • SEG15	O	Segment signal output to FL display
21	RESET	I	Reset signal input Input of reset for micro computer stand	63			
				64	VPP	I	FL motor power supply

SCHEMATIC DIAGRAM (Parts list on pages 17~20.)

Notes:

- S901, 902 : Preset channel switch.
(S901: Up, S902: Down)
- S903 : Band select switch.
- S904 : Memory switch.
- S905, 906 : Tuning switch.
(S905: Up, S906: Down)
- S907, 908 : Timer select Switch.
(S907: Up, S908: Down)
- S909 : Timer set switch.
- S910 : Clock set switch.
- S911 : Timer setting confirmatin switch.
- S912 : Timer cancel switch.
- S913 : Power switch.

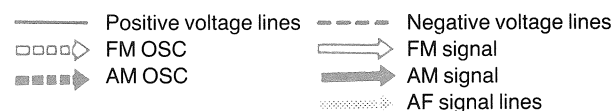
●Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

() : MW voltage, [] : LW voltage, □ : MUTING voltage

●Important safety notice

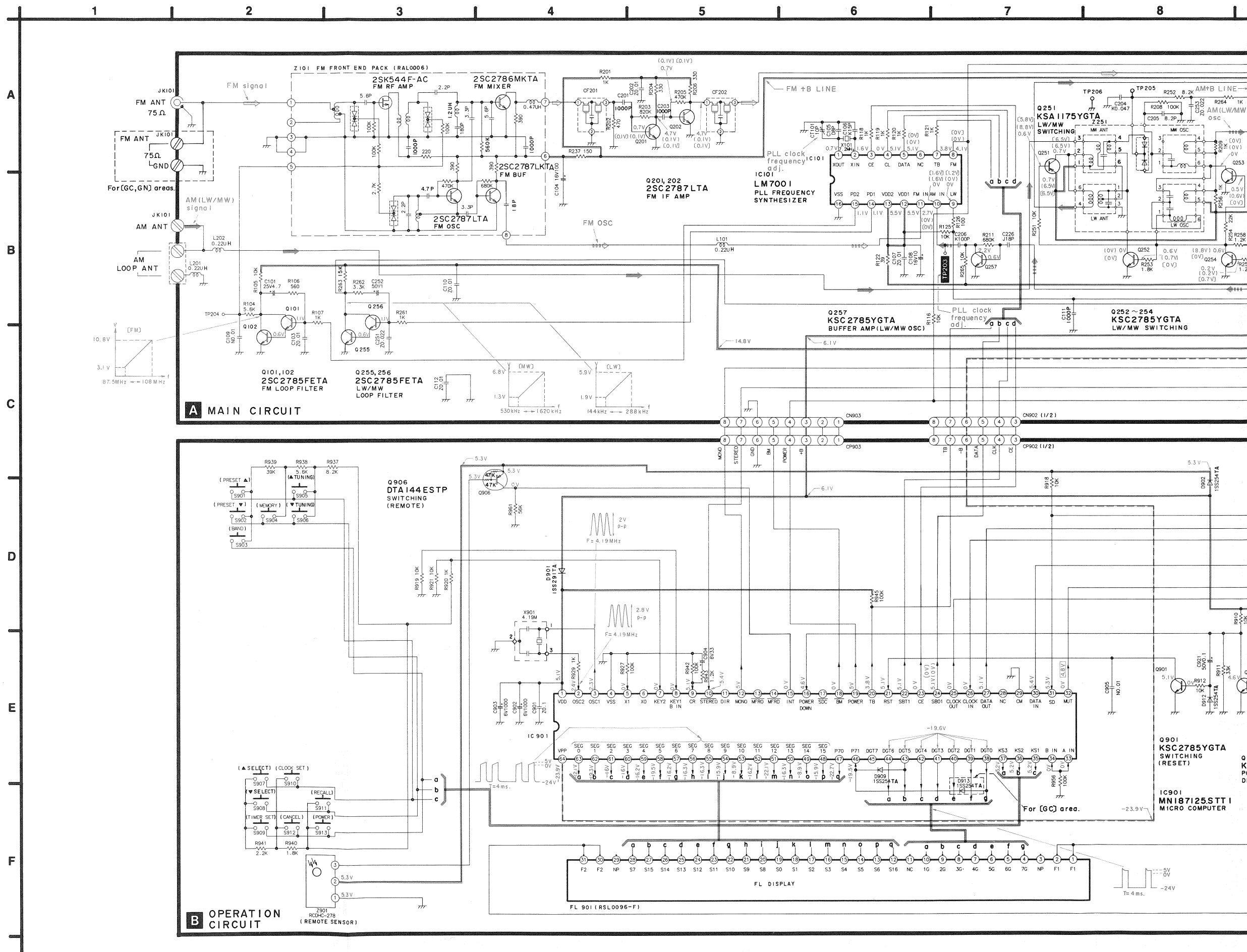
Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

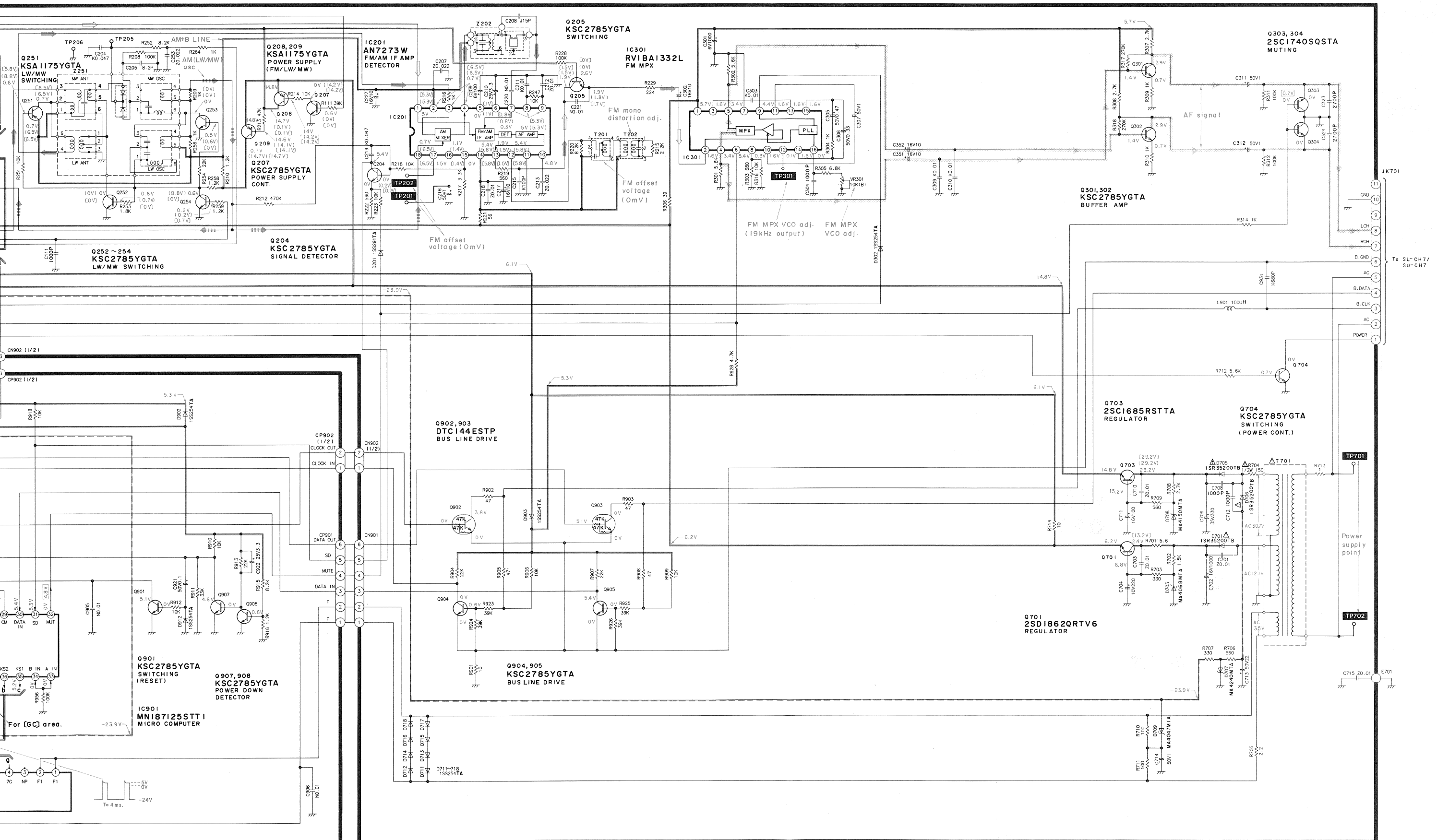
●This schematic diagram may be modified at any time with the development of new technology.



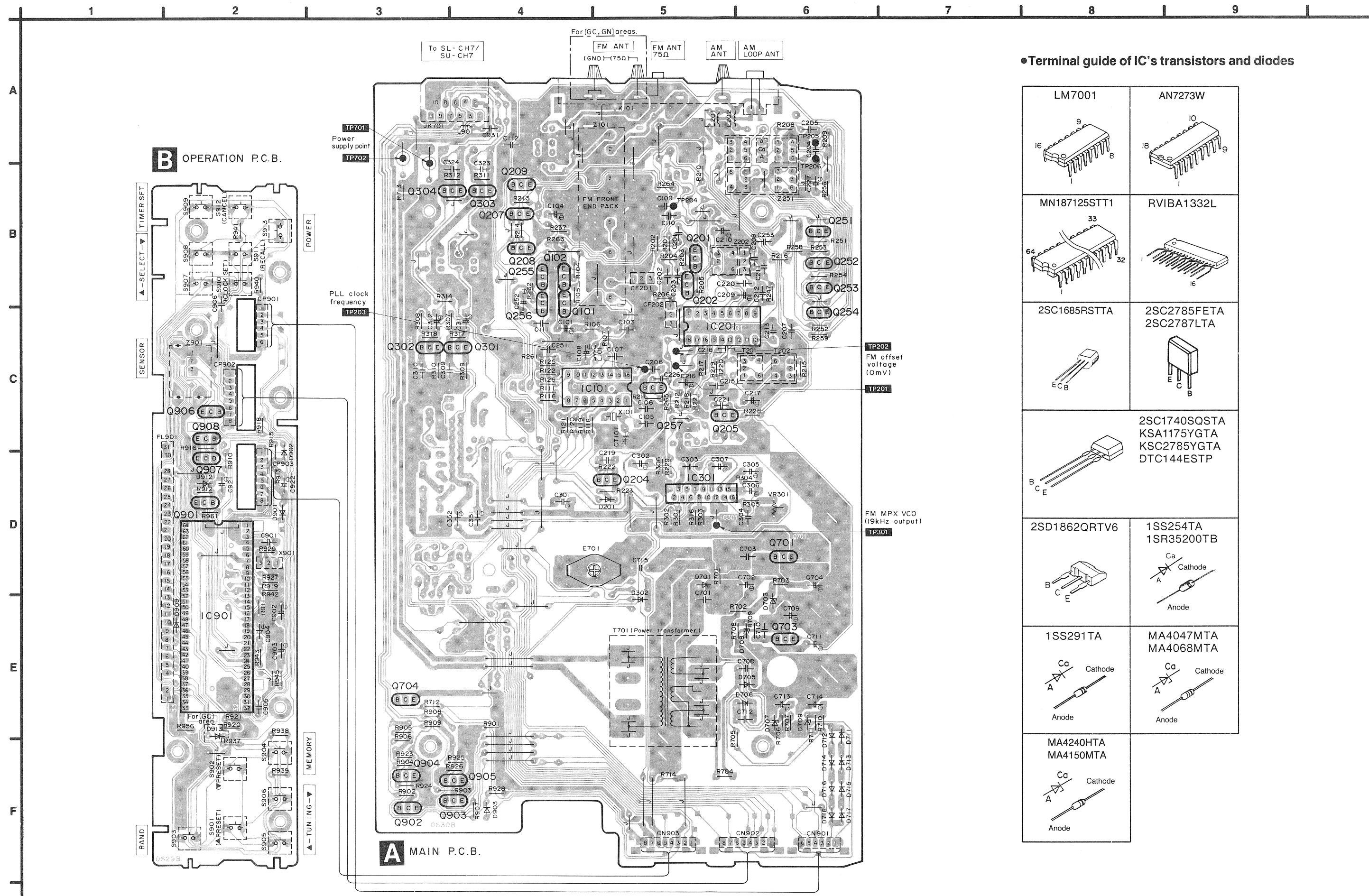
●Caution!

- IC and LSI are sensitive to static electricity. Secondary trouble can be prevented by taking care during repair.
- Cover the parts boxes made of plastics with aluminum coil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the legs of IC or LSI with the fingers directly.





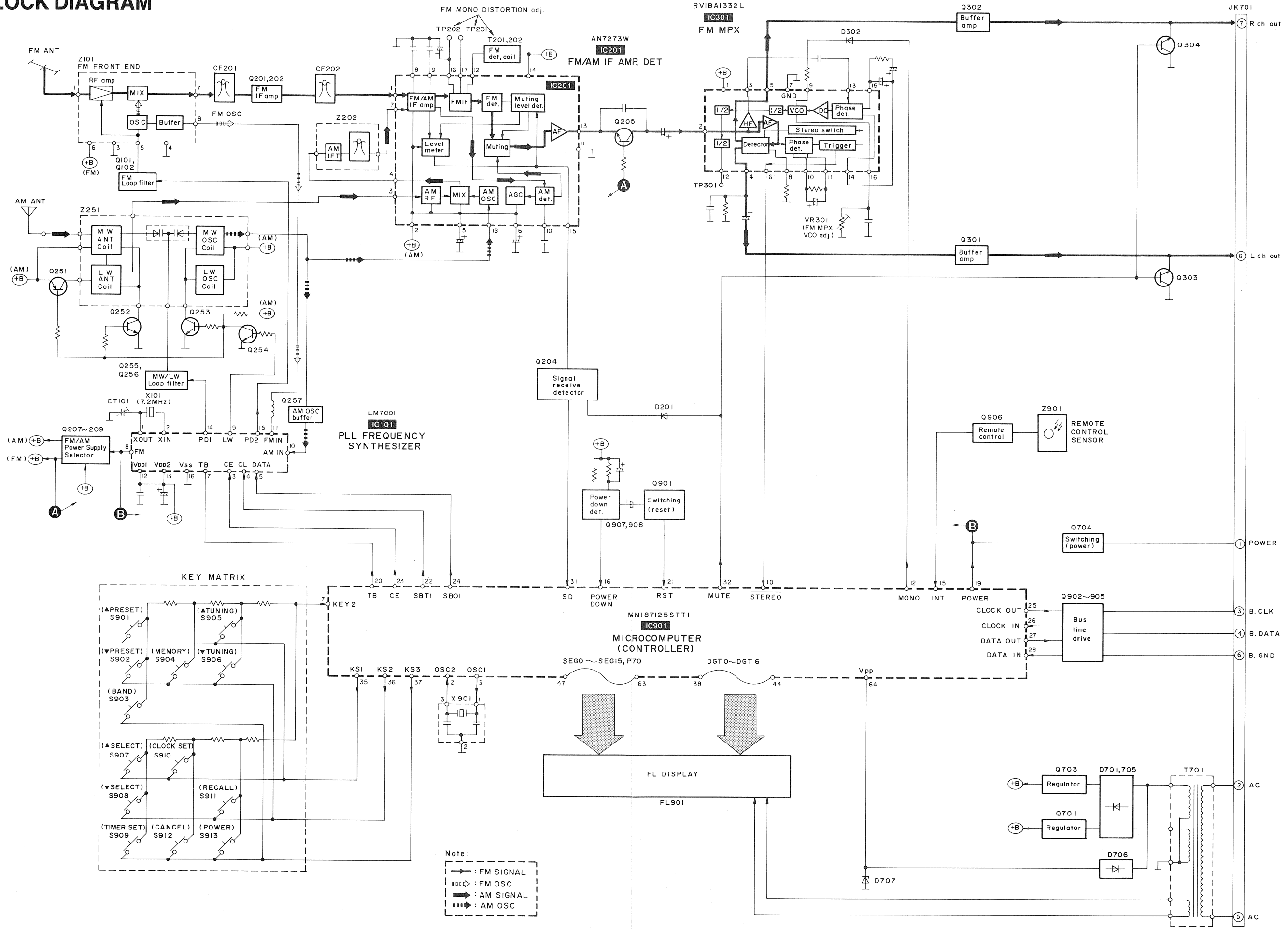
PRINTED CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM



Terminal guide of IC's transistors and diodes

<p>LM7001</p>	<p>AN7273W</p>
<p>MN187125STT1</p>	<p>RVIBA1332L</p>
<p>2SC1685RSTTA</p>	<p>2SC2785FETA 2SC2787LTA</p>
<p>2SC1740SQSTA KSA1175YGTA KSC2785YGTA DTC144ESTP</p>	
<p>2SD1862QRTV6</p>	<p>1SS254TA 1SR35200TB</p>
<p>1SS291TA</p>	<p>MA4047MTA MA4068MTA</p>
<p>MA4240HTA MA4150MTA</p>	

BLOCK DIAGRAM



Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET PARTS		9	RFKJ7CH7LE-K	CASSIS ASS'Y	
				9-1	SHG1654	FOOT	
1	RHD30007	SCREW		10	RGU0553-K	BUTTON, PRESET	
2	RKM0158-K	CABINET		11	RGU0554-K	BUTTON, TUNING	
3	RGRO116A-C	REAR PANEL	(E)	12	RGU0555-A	BUTTON, TIMER	
3	RGRO116A-D1	REAR PANEL	(GC, GN)	13	RGU0556-K	BUTTON, POWER	
4	RMRO427	HOLDER		14	RGU0557-K	BUTTON, BAND SELECT	
5	SHE170-2	SPACER		15	RFKGTCH7LE-K	FRONT PANEL ASS'Y	(E)
6	XTBS26+8J	SCREW		15	RFKGTCH7LGCK	FRONT PANEL ASS'Y	(GC, GN)
7	XTBS3+8JFZ1	SCREW		16	RMN0123	FL HOLDER	
8	XTB3+12JFZ	SCREW		17	XTB3+8JFZ	SCREW	

■ CABINET PARTS LOCATION

